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THIS school is devoted to the teaching of science, as applied to the various engineering professions; viz., civil, mechanical, mining, and electrical engineering, as well as to architecture, chemistry, metallurgy, physics, and natural history.

Besides the above distinctly professional courses, the Institute offers scientific courses of a less technical character, designed to give students a preparation for business callings. A four years' course in biology, chemistry, and physics has been established, as preparatory to the professional study of medicine.

Modern languages are taught, so far as is needed for the ready and accurate reading of scientific works and periodicals, and may be further pursued as a means of general training.

The constitutional and political history of England and the United States, political economy, and international law are taught, in a measure, to the students on all regular courses, and may be further pursued as optional studies.

Applicants for admission to the Institute are examined in English grammar, geography, French, arithmetic, algebra, modern history, and geometry. A fuller statement of the requirements for admission will be found in the catalogue, which will be sent without charge, on application.

A clear admission paper from any college of recognized character will be accepted as evidence of preparation, in place of an examination.

Graduates of colleges conferring degrees, who have the necessary qualifications for entering the third year class in any of the regular courses of the Institute, will be so admitted, provisionally, on the presentation of their diplomas, and will be given opportunity to make up all deficiencies in professional subjects.

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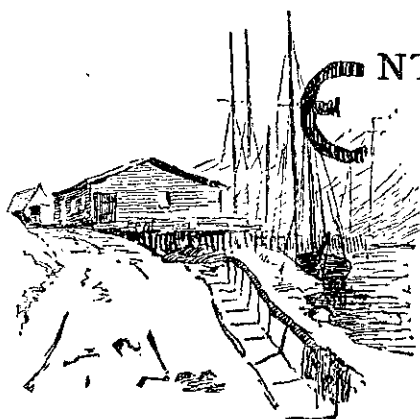
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ENTHUSIASM and sympathy are two of the greatest forces that act in human nature. Without enthusiasm nothing great can be accomplished; with it success in the most difficult undertakings

is assured. Without sympathy strong natures become weak, and weaker natures shrivel up; with it, joys are multiplied to infinity, and sorrows almost vanish. Therefore it is evident that those things which tend to create right enthusiasm and strengthen the higher sympathies should be encouraged.

College students are in the period of life when the mind is awakening to the fact of personality, when the imagination finds most food, when all the faculties are beginning to make themselves manifest; when, in short, enthusiasm and sympathy are most active. It is not strange, therefore, that this enthusiasm and this sympathy seek expression in some form, and the outcome is shown in the athletics and

societies peculiar to colleges. Football and baseball and the other sports give an opportunity for enthusiasm, while in clubs and societies the social side of the nature is cultivated.

There are many reasons why athletics and societies have been slow to enter the Institute life. The isolated way in which the students live, the application required on account of the severity of the courses of study, the difficulty in securing suitable accommodations without great expense,—these are reasons. But each of these causes is a reason why athletics and societies, when once established, should be nourished and sustained. If the students are isolated, they can come together only in clubs and societies; if close study is required, the best reaction is found in bodily exercise; if expense is involved, organization will meet it. To support class, club, or team with voice, hand, heart—this is enthusiasm: to share alike the good and ill—this is sympathy. Develop these, and the life will have a tone and color never known before.

IT is a matter of common regret that vacations at the Institute are at such a minimum. While we would not advocate any extended recesses during the school year, as is the custom at other colleges, we feel sure that at least one let-up of a week in addition to the semi-annual breathing spell, would be greatly appreciated by every member of the Institute. Such a recess would enable the student to make a much-needed review of the previous work, thus fixing it more firmly in mind, and would afford an opportunity to make up the odds and ends of back work, which will always accumulate, and get "cleared up" for another period of work. We are confident that with a few days at Christmas, and again in the middle of the second term, there would be just as much work accomplished, and

that in some cases there would be a "C," or "P," in place of an "F," in consequence. At any rate let us have the experiment.

IN a technical school of the nature of the Institute, the three years devoted strictly to professional work in the various departments are by no means sufficient to familiarize one with the *details* of one's chosen profession; indeed, little more is attempted than to give one a very general idea of the subjects treated; or perhaps, more properly speaking, the object aimed at by the various courses is to teach men *how* to study and *how* to investigate for themselves. Thus the Institute man's time is more than filled, up to the very last, with studies necessarily of a preparatory nature, since, of course, in the time allotted, only comparatively few of the practical problems that he is sure to meet with in life can here be solved.

Now, speaking particularly for the moment of the course in mechanical engineering, the Institute has, within the last two or three years, acquired facilities in the way of finely equipped laboratories and work-shops in this department, that place it undoubtedly in the front rank of industrial schools of its class. Our machinery is constantly increasing every year, and is decidedly up to the times in every respect. To any student, therefore, who can afford the time and money, it seems as if, after having taken the regular course in mechanical engineering, and graduated, he could spend his time to no better advantage in learning his profession, than by devoting at least a year in pursuing a special course at the Institute. He would by the time he graduated, be sufficiently developed and trained to choose wisely some particular line of work, which he would have plenty of time to carry on, keeping at the same time an eye open to what is going on in the engineering world without.

We have taken Course II as an example, merely because of the extent and marked increase of late in its working equipments. The same is as true with regard to Course V, with its excellent laboratories, and Course VIII B,

which, although as yet in its infancy, will probably in time be furnished with electrical machinery of its own, apart from the Rogers Physical Laboratory, now at its disposal, thereby enabling more extended practical research in the field of electricity very desirable. With respect, however, to such courses as architecture, and civil or mining engineering, perhaps the above would not apply with equal force.

The Institute encourages and approves of post-graduate study, as is shown by the advanced degrees which the Corporation has been authorized to confer for one or two years extra work. Even setting the matter of degrees entirely aside, it seems as if the benefit to be derived by more extended study in certain departments would be very great, and it is hoped that many will avail themselves of the advantage.

IT is hoped that the students who avail themselves of THE TECH's kindness by reading the exchanges which it places in the reading-room, will use more care in handling them. Most of those already placed on the tables have been so badly torn and mutilated, as to wholly unfit them for being placed on file. Will the students please bear in mind the fact that it is merely a courtesy on the part of THE TECH in thus putting the papers at their disposal, and unless more care is taken in the future they will not appear in the reading-room, for it would seem as if they could be read without being used as projectiles, or torn all to pieces.

NOTICE.—Copies of No. 3, Vol. II., No. 1, Vol. III., and No. 6, Vol. III., of THE TECH, will be bought at this office at the regular price. Persons having any extra copies of these numbers which they are willing to dispose of, will confer a favor on us by notifying the Secretary.

MR. GUY KIRKHAM, '87, has been elected an editor of THE TECH, and begins his duties with the present number.

Kissed.

Fair Phyllis walked the summer lane
Where rose and hawthorn grew,
But sweeter far this fair young maid
Than any flower I knew.

The sun kissed Phyllis's fair cheek,
Her golden hair caressed,
And kissed again her ruby lips
Where ne'er a lover's lip had pressed.

Again she walks the summer lane,
Tho' later 'tis, the sun has gone,
The flowers sleep; and what doth she?
Is't possible she's not alone?

The moon is up, but kisses still
Rest on her cheek and golden hair;
The *sun*! Why, yes — my neighbor's *son*,
Has found her sweet beyond compare.

The moral to this little tale,
If any moral, 'tis but this;
When'er you see a pretty maid,
You think the *sun* doth only kiss,

Remember she walks by the moon,
And up and down the shady lane,
And where the dewy roses sleep
By *son* and moon she kissed again.

F. L. V. H.

An Unknown Land.

IT hardly seems possible that an eight days' trip can transport one from the hurly-burly of this stirring nineteenth century, into the quiet, superstitious fourteenth, with all its accompaniments of primitive ideas, agriculture, ways, and manners. Yet situated five hundred miles to the westward of Portugal, extending in a north-westerly direction, may be found this laggard territory, that has escaped the hand of time, and dozes away in a quiet medieval siesta, lullabyed by the incessant swash of the tireless Atlantic.

Nine islands form this domain, and are known by name only to the world at large as the Azores, or Western Islands, which have been christened by their discoverers, Santa Maira, St. Michaels, Tuceira, Graciosa, St. Jorge, Pico, Fayal, Flores, and Coroo, and cover a distance from east to west of about two hundred and fifty miles. St. Michaels is the largest of the group, being about fifty miles in length by twelve in breadth, and contains the metropolis,

Ponta-Delgada, a city of about twenty-five thousand inhabitants.

The island is volcanic, and as seen from the sea presents a singularly unique appearance. Level at its western extremity, the land gradually swells into small volcanic hills, rising more abruptly as one goes eastward, until near the center as many as twenty or thirty of these cones can be counted, green to the very summit, looking like so many excrescences, some of which reach an elevation of fifteen hundred feet. From the center the land gradually sinks, until nothing but a low ridge remains; this forms a sort of back-bone that hides the waters of the northern and southern shores from sight. This breaks abruptly against an immense wave of land that is caught up three thousand feet, in folds, and hangs against the eastern sky, receiving that indescribable coloring of light and shade that has been denominated Italian. East of this rise jagged peaks with precipitous sides, that skirt the island to its farthest extremity, presenting a bold and forbidding coast-line.

There is a sameness about all Spanish and Portuguese architecture that is very tiresome to the eye — an eternal stretch of whitewashed walls and tiled roofs, barred windows and hanging balconies, especially when one has been educated to believe in diversity. The little narrow streets run aimlessly around, paved with cobble-stones that try the uprightness of one's soles, and fringed with a foot and a half sidewalk, that affords a sort of refuge where donkeys and mules dispute the right of way. As all roads lead to Rome, so in a Portuguese, indirect, *paciencia* style, the different *rivas* or streets, empty one into the other, until they halt before the glory of the town, — the Plaza, a square, bounded with tall, dusty trees, beneath which are settees fronting a pagoda-shaped edifice, in which the military band holds forth three evenings in the week. Here, Merrina, Maria, Gonzoles, Pochico, Machado, Estrella, Domingo, Alveda, surrounded by grandmothers, aunts, uncles, and brothers, takes their promenade. Hovering on the edge saunter the *cabelleros*, who manage, in spite of the hedging in of their

divinity, to exchange eye, head, or handkerchief conversation. Round and round the broad way walk these family sets, bowing and saluting with grand eloquent nothings, which, if endowed with Saxon truth, would impoverish the entire island.

The shops are entirely devoid of windows, for which they make up with doors; and as it is only the lower class that shop,—the upper and wealthy having everything sent to the house to select from,—the want is not so greatly felt except by visitors, who feel like crying out as they strain their eyes, or find themselves under the necessity of asking the clerk to accompany them into the street, that they may get a view of their intended purchase. Society is divided into an infinite number of cliques, between which the line of demarkation is drawn with exact sharpness, and over the barriers of which a lifetime is too short to gain admittance. Family feuds, politics and pride of birth serve to maintain this exclusiveness, so that a foreigner, although a resident for many years, and perhaps having a street or café acquaintance with what we should call society men, rarely knows more about its workings than what he chances to pick up as he sips his chocolate. It is to the peasantry that we have to look for information as to the general condition of the people, and where we find that tenacity for stepping in the footsteps of their forefathers that has made any advancement an impossibility. The farmer breaks his ground with a sharp stick, tipped with iron, from which projects a pole, by means of which it is connected with whatever propelling power the good man may be able to lay hold of; sometimes it is a yoke of cattle—this seldom—oftener a solitary “burro,” or donkey, and not unfrequently the better-half and Jack attached side by side—partners in toil and in the misery of the long pole, with which the owner and husband prods without partiality both wife and beast.

Every instrument of toil seems a resurrected one; even the hoe, with its broad blade, massive weight, and tiny handle, that compels the laborer to bend double, and exert as much

strength to cut a weed as to chop a stick, shows all the crudeness of workmanship that a first effort at manufacture would lead to expect. Harvest arrived, the grain is reaped, and the ancient method of thrashing by means of treading, employed.

The vehicle by which the grain is transported to market deserves attention, as it not only embodies carriage, but also a sort of spirituality, that to the owner is worth thrice its value.

It is a massive affair—a box mounted on two immense wheels, made of solid wood, spokeless, with a shaft firmly attached to each, which revolves with the wheels. The box has a groove in which the shaft turns, and, as it does so, emits a most heart-rending and piercing shriek, that delights the farmer’s soul. So dear is this music to him, that he composes ditties to its honor, and watches its volume of sound with all the eagerness of a lover. Witches and demons, with which the island is filled, are rendered harmless during its powerful squeaks, and thus the belated driver is protected from the unseen evil that presses close around, ready to lure him on to disaster.

The dress of the peasantry is white linen; for the masculine portion, trousers, a long, white gown, and a head-dress called a *carrapucha*—a cap with a vizor of tremendous extent, usually made of blue cloth. This, with wooden shoes, constitutes their summer and winter attire. The feminine portion generally manage to set off their white dresses with some bit of coloring, and robe their heads with fancifully arranged handkerchiefs of bright colors, from which their dark, Moorish faces peep out, giving the passer a glimpse of large, lustrous eyes, capable of all the intensity and softness born of emotion.

The one great object of a girl, and for which she hoards every penny, is to be able to enter the matrimonial estate with a *capôte*. The *capôte* is a garment that combines a cloak with a head-dress; the first of such length as to completely envelope the person, and is made out of thick, heavy cloth, so substantially put together as to last a lifetime. It costs forty dollars; and when one remembers that twenty-four cents a

day is good pay for a man's work, it will be easy to understand the scrapings, toil, trouble, and years of labor the attainment of such an object costs. The head is the most peculiar part of the *capôte*, and resembles, as much as anything, an exaggerated type of the style called "pumpkin." It juts far out beyond the wearer's face, and is stiffened with canvas, so that it moves neither to the right nor left, and when in motion gives the strange appearance of an animated head and cloak walking off independently of any external power. When two *capôtes* meet, the heads form a sort of arch, beneath which the happy possessors, entirely hidden from the outside world, can safely carry on the most delicate and secret conversation as securely as if lodged beneath their own roof. In years gone by it was the favorite disguise of Lisbon assassins — so much so that the Government was at last forced to forbid its being worn in that city. It has long since completely disappeared from the Continent, and is to be found only among these islands, a relic of the long past.

Space forbids me to go into the folk-lore of these islanders; but it is a rich field, and will repay the looking up, so closely connected is it with that which pervaded Southern Europe four hundred years ago.

J. T. G.

The Copper-Smelting Works at Lota, Chili.

THE little town of Lota is situated on a bay of the same name, about two hundred miles south of Valparaiso. The metallurgical works and coal-mines, to which it owes its importance, are owned by Madam Cousiño, a wealthy Chilean widow, and most of the inhabitants are in her employ. The copper-works are situated on the shore of the bay, at the foot of a steep hill. The buildings are large, open sheds, under which are over one hundred reverberatory furnaces, arranged in pairs on either side of a central flue, which leads to a tall chimney. The assay office is in a stone building at the southern end of the works. The chemist is a German. He uses the cyanide volumetric method for copper

in slags, etc.; also the Swansea fire assay, and the ordinary gravimetric methods.

The ore used is the ordinary sulphuret of copper and iron, and they employ the silicate and carbonate ores, chrysocolla and malachite, for fluxes. The ore is low grade, carrying upward of five per cent copper. It is roasted in stalls mixed with the proper proportion of the fluxing ores, and smelted to a matte. This is roasted, and run to black copper, which is refined in hollow bed reverberatory furnaces in the ordinary manner. The only point about the process, that struck me as peculiar, was the entire absence of cupola or blast furnaces, all the operations being conducted in reverberatories of various patterns. The manager, who came from Swansea, Wales, claimed that the reverberatory gave better satisfaction, as they were situated, with less loss of copper.

The work goes on day and night, there being three shifts in the twenty-four hours. The workmen are all natives. They do very good work, and receive about fifty cents per day, also getting a cottage and their coal free of charge.

The slag from the works is cast into blocks, and used to build sea-walls, piers, etc. The refined ingot copper is shipped to England in sailing-vessels. The coal used at the works is obtained near by, one of the mines being in the hill back of them, so that fuel costs only the expense of mining.

The coal is a high-grade lignite, resembling very much the coals from Oregon and Washington Territory. Some of the coal-mines extend out under the sea, and not long before my visit an earthquake fissured the rock above one mine to such an extent that the sea rushed in, drowned several unfortunate miners, and ruined the mine. The largest mine is worked from a vertical shaft about four hundred feet deep, and a number of seams are worked at different levels by the pillar and stall system. A large Cornish pump keeps the mine free from water. A flat wire rope is used for hoisting, with a compensating drum. The coal is mined into iron cars, holding about five hundred kilos. These come upon the cage, and are run to the

dumping-shed on a narrow track, the propelling power being an endless wire rope, which is merely laid on the top of the car, and pulls it along by friction. The rope passes around a pulley at the dumping-shed, and carries the empty cars back in the same manner. Arrived at the dumping-shed, the cars are taken off the rope and run across a platform scale, weighed, and then automatically dumped, the contents passing through a chute into the launch waiting at the wharf below. The empty car is then rolled back and put under the rope, which is returning to the shaft-house, and is thus carried back. The Superintendent is a young Chilian educated in England. The coal is sold to the Chilian Government, at \$5.00 per ton, but foreign vessels have to pay \$10.00 and \$11.00, which seems a pretty high price for such a quality of coal.

A. O. D.

Italy's Last Monastery.

WITHIN the last few years the Government of Italy has done away with the monasteries which were so numerous all over the country, and now the only traces of them are the buildings of a few monks who have been permitted to remain in the churches for the purpose of taking care of them. The buildings, except the churches, have been turned into barracks, so that now a force occupies them which is very unfriendly to the former one. Some of these monasteries had most magnificent churches attached to them, but these are left for public uses, and, as I have said, are taken care of by a few monks whom the Government has permitted to remain. One example of these is the church we see pictured so often in paintings of Venice, (St. Maria Della Salute); around it is an immense building, once forming the monastery, but now the barracks of the soldiers, and in the church are three monks, who are always to be seen, and whose duty it is to look after it.

But there is one monastery which the Italian Government has suffered to remain and carry out its full object. This is situated on the Island of St. Lazzaro, two miles to the north-east of Venice. It is a very picturesque place,

with its long, massive buildings, surrounded by vineyards and gardens.

As we landed we were introduced to the monk of whom we were in search, and were very much surprised on hearing him speak English as well as we did. We had expected on seeing this monk to find one of the type which we find portrayed in so many books. To be sure he was bearded, wore a skull-cap, and his long, dark cassock belted in at the waist with a cord, from the ends of which hung crosses; but he possessed much original fun, spoke numerous languages, was well read, and conversed fluently on almost any subject. He explained, before showing us over the monastery, that they were Armenians, and the reason why the Government sanctioned their existence was, that they had for their main object the education of boys, and, besides, they were independent of outside support.

He first took us to the chapel, which was very pretty, and not overdone; the features of this were not new, being the same as in all Catholic churches. We noticed, while walking down the aisle, that there were tombs in the floor, and upon inquiring, found that the monks were buried there when they died.

From the chapel we were taken through a long corridor, out of which the rooms of the different monks led. Some of the doors being open, the monks could be seen either writing or reading. At the end of the corridor was a large room very much resembling an elaborate parlor, but there were numerous scientific instruments scattered around, a cylindrical friction, and a Holtz electrical machine, a rude kind of a dynamo, and other contrivances of like nature. We were told that the lesson that day had been on electricity, showing this room to be a reception and schoolroom combined. From here we were led to Lord Byron's study, this being the room where he wrote many of his poems, and learned the Armenian language. In the center of this room was a large case, containing various things which he used, together with a letter written and signed by him. Also in the corner was a case, which contained the pictures of many distinguished men who

have visited this island and left their portraits with signatures affixed. Among these were those of Gen. Grant and Gen. Sherman. Before leaving this room we were asked to register our names, this being the custom with every visitor.

On our way down-stairs we noticed the odor of coffee, and on entering the kitchen, we found a monk in the act of roasting it. Next to this room is the dining-room, with very long tables, and in the center is a kind of pulpit, somewhat raised from the floor. We inquired the purpose of this in the dining-room, and were told that during the time of eating no talking was allowed, and every one was obliged to listen to the reading of the Bible.

In going to the next building we passed through a small vineyard and fig orchard, and were lucky enough to be there in the time of ripe grapes and figs, which were indeed a treat.

The next and last building which we entered contained a large printing-room, where books and pamphlets are printed in all languages for the benefit of the students and those visitors who may wish to buy them. Upon asking permission to see some of these books, we were conducted to a small adjoining room which was completely packed with printed matter. Here also could be purchased very ancient books, and all kinds of Turkish ware, such as silks and laces, or even rugs, and one could be very sure that these were genuine.

The monks spend most of their time either in writing for print or in educating the boys. They are subject to one head-monk, who resides in Armenia, and has the power of sending them wherever he wishes.

W. H. G.

The Miners' Excursion.

ON Monday, November 23d, a party consisting of the fourth-year miners and two of the third-year class, accompanied by Prof. Richards, left the Fitchburg Railroad station for a three days' excursion to some mines in the western part of this State and in New York. It was raining hard when we left Boston, but a few miles out of the city it became snow; and

as the storm kept increasing the farther west we went, the prospect of our enjoying a sleigh-ride seemed good. Our expectation, however, was not fulfilled.

We arrived at Charlemont at 12 M., that being the nearest station to our first destination — the Davis pyrite mine, at Rowe. On account of some misunderstanding, the man who was to drive us to the mine had not provided sufficient accommodation. After a dreary wait of an hour, we succeeded in procuring a second team, and started upon a six-mile drive through the snow-storm. We were received at the mine very courteously by the superintendent, and visited the workings. The pyrite vein was from ten to twenty feet wide, and the ore is taken out by underhand stoping.

We left Charlemont at 7.30 P. M., and arrived at Troy at 9.30. The next morning we visited the Albany and Rensselaer Iron and Steel Company's works, and witnessed the operations of the rolling-mill and the Bessemer-steel department. We next went to the Rensselaer Polytechnic Institute, but were unable to go all through its buildings, on account of our limited time.

We started for Brewster at 1.30 P. M., and arrived there at 6.30. Early the next morning we proceeded to the Tilly Foster iron mine, and were conducted through the workings by the engineer, Mr. Parker, Columbia, '80. Our attention was particularly called to the new system, attempted at this mine, of supporting the hanging wall by concrete pillars, and then removing the old pillars of ore. Two hundred thousand tons of ore are to be opened up in this way.

We arrived back at Brewster at noon, and the party broke up. The sun did not shine once during our trip; but notwithstanding the unfavorable weather, it was a most successful one, and much valuable information was gained.

Young Housewife: "Mr. Brown, how do you sell your chickens?"

Dealer: "Sixty cents a pound, ma'am."

Young Housewife (vaguely): "Ah, and about how many are there in a pound, please?"

Football.

TECHNOLOGY, 80; AMHERST, 0.

The Technology-Amherst game of Saturday, Nov. 21st, finished the season at Amherst, Technology winning with ease. Amherst was without the services of Nourse, Harris and Phillips. Play was called at 2.20, the Techs having the kick-off. Holden rushed the ball a distance and then kicked, and in two minutes Amherst made a safety. Three minutes after, Twombly made a touchdown, from which Holden kicked a goal. Stearns rushed the ball, on Amherst's kick-off, to the Tech 25-yard line, but here the latter did some fine blocking and rushing, and Fletcher soon secured a touchdown, and a goal was kicked. Touchdowns and goals followed rapidly, and time was called with the score 54 to 0 in favor of the Techs.

Amherst braced in the second half, but the good tackling of our rushers prevented their scoring, while the Techs brought the score up to 80.

The team played the best game of the season, backing each other admirably, Holden, Cooley, Fletcher, Twombly, Herrick, Ladd, and Bowles doing fine work. The Amhersts failed in team-work, though Stearns, Houghton, Haskell and Ripley did some excellent playing.

WILLIAMS, 18; TECHNOLOGY, 10.

Springfield, Nov. 25th.—The game which was to decide the championship of the Northern Intercollegiate Foot-ball League, was begun under circumstances the most unfavorable to good play. The clayey ground was saturated with the rain and plastered with the snow of a three days' storm; the chilling and depressing rain was steadily falling. At 2.20, notwithstanding, the teams were sent on the field, amid the cheers of the seventy or eighty men from each college who, protected by overcoats and umbrellas, had come to see it out. Both elevens were in fine condition, as the Techs had been training and practicing faithfully, and Williams had been under the eye of an old college player. Williams had the kick-off, and sent the ball out of bounds to the left. It was forced back into

Williams territory, but returned by a long punt Holden made a fine catch, but slipped and fell. Luck favored Williams, and the ball was worked to the Techs 25-yard line. A good rush by Taft carried it nearly to the goal line, and at 2.30 Field made a touchdown, from which Safford kicked a goal.

The ball, after being put in play, started for the Tech goal line, but good half-back play and rushing forced it back, and nearly to the other end of the field. Here some of the most skillful play of the game was done, and Twombly made a touchdown, from which Holden kicked a goal, and the score was tied.

Field made a long run from the Williams kick-off, but was tackled and thrown in great shape by Herrick, who was playing in fine form. Soon, however, Field secured another touch-down for Williams, and it was punted out, but the fair catch was missed. Ball, ground and players all were coated with the wet slime, and scientific foot-ball was impossible. Again the luck was against the Techs, and yielded Williams a safety, and the first half closed with the score 12 to 6, in the latter's favor.

After ten minutes of brisk walking, rubbing, and slapping, the players threw off their wraps and resumed work. Cooley, Bowles, Fletcher, Herrick and Ladd rushed hard and effectively. Sturges kicked long and well, and Shortall played pluckily, and dropped on the ball in many critical places. In spite of their splendid efforts the ball was nearly to our goal line, when Fletcher secured it, and, dodging the Williams rushers, made a magnificent run, and was not downed until within a few yards of the Williams goal line. The ball was snapped and passed back to Herrick, who went right through a string of Williams men, and touched the ball down over the line. The ball was too slippery to handle, and the punt-out failed, and the play was taken into the Techs' ground. Carse made a touchdown, but no goal was kicked. Soon after, the Techs made, as they thought, a touch-back, but the referee called it a safety touch-down, and time was called with the ball in the center of the field,

Most of the players became chilled through and, toward the end of the game, several were so utterly exhausted, that Devens, Taintor and Mahon, were brought into requisition. Not a man on the team but did excellent work, and Technology has reason to be proud of the eleven, which has made such a glorious fight for the championship. It was a stubborn contest, and Williams is jubilant over the success of the purple. Never before has Technology been so well upheld, and we can look to the future with the greatest confidence. The score by points: Williams, one goal, two touch-downs, with two safeties by Technology; Technology, one goal, and one touch-down; total, 18 points to 10. Referee, W. F. Whiting, Amherst, '85.

From Springfield, when the sun was low,
Through trampled slush and sodden snow,
A sad, soaked band of Techs did go,
A-swearing deep and savagely.

Oh, had that day been warm and bright,
We should have seen another sight,—
A hundred Techs in wild delight
A-shouting most vociferously!

Noticeable Articles.

Macmillan's for November is unusually interesting. The best paper in it is the admirable address on Culture and Science, by Prof. Sonnenschein, Professor of Classics in Mason College, Birmingham; a college founded and nobly endowed five years ago by a wealthy Birmingham manufacturer, and which, though established chiefly for the promotion of technical education and the study of physical science, does not neglect literature, and finds room even for a professorship of the ancient classics. In all the literature of the interminable so-called classical controversy, I have never met with a paper written in a broader or more catholic spirit, or which avoids more successfully the absurdities and ineptitudes of one-sided champions in the dispute. Prof. Sonnenschein begins with a much-needed description of the word Science: "By Science I understand organized knowledge, working by method, based on evidence, and issuing in the discovery of law." The abuse has grown almost inveterate, in this country especially, of limiting the application of the term science to Physical Science, compounding, as a German would say, *Wissenschaft* with *Natur Wissen-*

schaft—as though there was no such thing as linguistic science, or ethical or historical science. A perception of this ambiguity would have saved the educational disputants from half their blunders. Prof. Sonnenschein, as an educated German, is quite above such a mistake. "Let us cease," he says, "to oppose one subject to another as scientific and non-scientific. The distinction is not in subjects, but in methods of teaching them. Let us hold fast to the position that science is a particular method of teaching subjects, leading to results of a particular kind." He goes on with an enlightened defense of his own particular theories, from the point of view of a real German *Gelehrte*, brought up in a country where classical philology is itself a true science. "Grammar," he says, "is not the arbitrary creation of schoolmasters, but the record of law discovered by the patient observation of ages, and liable to revision by any independent engineer into the phenomena of language." It is because in England and America grammar has been taught so long as if it were "the arbitrary creation of schoolmasters," that the grammars of the ancient tongues have fallen into such discredit, and that a writer's command of his mother tongue is usually found to be in inverse ratio to his study of its grammar.

Prof. Sonnenschein naturally gives full weight to the evidence of German scholars in all departments as to the educational value, as mental discipline, of the study of the ancient classics as pursued in Germany—that is to say, in a truly scientific manner; but he is candid enough to admit that even in Germany the study of physical science, and the scientific study of modern languages is constantly gaining ground on its older rival. The methods of teaching the modern subjects could not at the outset rival these methods of teaching the older subjects, which have been brought to perfection by generations of teaching experience. But this is only a question of time, and when the methods of teaching modern physical science and modern languages shall have been as well adapted to the accomplishment of the true end of all education, namely, mental training, they will stand on an equal footing, and all antagonism will disappear, and the senseless distinction of "classical" and "non-classical" will vanish from educational discussions. All education will be "scientific" that is worthy of the name, and it will become a question of individual taste and aptitude to which one of many lines of study the individual student shall chiefly apply himself.

Equally good are Prof. Sonnenschein's remarks on the necessity to the scientific student of cultivating in himself the poetic spirit, and of the difference between the two. He believes in Coleridge's distinction, who said that the antithesis to poetry was not power, but science. The distinction is between the poetic and the scientific attitude of mind, and both are useful to the true student. "I know of a young man," he says, "trained in mathematics and Latin grammar; who patiently—almost pathetically—read and re-read his *Sartor Resartus* in the hope of finding a suggestion or some substance of a proposition of Euclid in it, and who did not understand it. Like the mathematical reader of *Paradise Lost*, he could not make out that it proved anything." "Intellectual manhood," he says in another place, "is not reached till concentration, exact inquiry, begins; but the mind grows poor without the poetical spirit. There is one truth of science and another of poetry, and both are indispensable."

I have left myself little space to speak of the other papers. There is a melancholy poem of Tennyson's—*Lord Tennyson* we must call him, since he has seen fit so to decorate himself—entitled *Vastness*; a gloomy comparison between the greatness of the universe, and the petty and disgraceful ways of us poor human beings:—

Raving politics never at rest, as this poor earth's pale history runs:
What is it all but a trouble of ants in the gleam of a million million of suns?

and so on, in verses that are certainly vigorous, till one begins to wish Lord Tennyson a better digestion. But we will assent to the conclusion:—

What is it all if we all of us end in being our own corpse-coffins at last,
Swallow'd in *Vastness*, lost in Silence, drown'd in the deeps of a meaningless Past?
What but a murmur of gnats in the gloom, or a moment's anger of bees in their hive?
* * * * *
Peace, let it be! for I loved him, and love him forever!
The dead are not dead, but alive.

There is a paper on Austria's Policy in the East, by a writer who understands his subject; another entitled *Some American Notes*, by a writer who does not believe that a few weeks' run through the United States entitles him to write a book about us, but who saw enough to come to the conclusion that we are all drying up in this country, and that "the typical American is the *slowest* and most *lethargic* of men."

There is also an account of Village Life in India, an article on Gouverneur Morris and the French Revolution, and a pleasant paper entitled, on Classic Ground; the classic ground not being Greece or Italy, but the neighborhood of Oxford and the scene of Matthew Arnold's two beautiful poems, *Thyrsis* and *The Scholar Gipsy*.
W. P. A.

Harper's for December is at hand, and is one of the finest numbers of this ever popular magazine, both in the fields of art and of literature. Its engravings are superb, and its poetry and fiction are of an unusually high order. Besides installments of the regular serials by Constance Fenimore Woolson and W. D. Howells, there is a very interesting farce by the latter entitled, "The Garroters," in the same vein as "The Elevator," "The Register," etc., by the same author. Other leading features in this number are very characteristic stories by Elizabeth Stuart Phelps and Charles Egbert Craddock; poems by Wm. Black and Edwin Arnold; and a finely illustrated and very readable paper by Henry J. Van Dyke, Jr., on "The Nativity in Art."

In the December *Atlantic* are several articles of interest, among which that of Horace E. Scudder on "Childhood in Modern Literature and Art" deserves special mention. Oliver Wendell Holmes has in this number a pleasant sketch entitled "The New Portfolio," and all would do well to read the anonymous "Essay on Louis Agassiz."

Communications.

The editors do not hold themselves responsible for opinions expressed by correspondents.

DEAR MR. EDITOR: It is a pity that the writer of the article in the last *TECH*, referring to the conduct of the freshmen on the opening night of the Hollis Street Theatre, could not have been more explicit, and conveyed to the reader a more correct idea of the make-up of the class of '89.

It is undeniably true, that a party of students some twenty-five or thirty in number, and perhaps a majority of them freshmen, did attend the theatre on that evening, and conduct themselves in a very obnoxious manner. It is also true that the few '89 men who went comprise the fresh element of the class, and on their shoulders should rest the blame and censure.

On that occasion the class of '89 did not attend the theatre. The reader of the above-mentioned article would get the impression that the majority of the class went, which was not the case. " '89."



F. H. Morgan, '78, Instructor in Analytical Chemistry in Cornell University, box 1960, Ithaca, N. Y.

D. S. Goddard, '81, with Coburn Shuttle Co., Lowell, Mass.

Edwin J. Lewis, Jr., '81, Architect, Saville & Lewis, Engineers and Architects, Exchange Place, Boston, Mass.

James Lund, '81, Instructor in Quantitative Analysis in Cornell University, box 97, Ithaca, N. Y.

Edward G. Gardiner, '82, Assistant in Biology, Mass. Inst. of Tech.

Grenville T. Snelling, '82, Student of Architecture, Ecole National et Speciale des Beaux Arts.

Charles B. Appleton, '84, Draughting for the Golden Gate Concentrator Co., Boston, Mass.

Jas. F. Davenport, Jr., '85, with Merchant's Mill, Fall River, Mass.

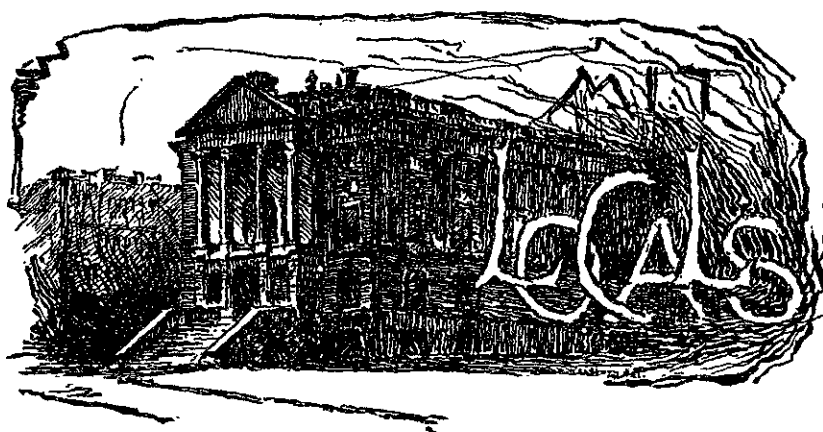
Wm. H. Eddy, '85, in Merchant's Mill, Fall River, Mass.

H. G. Pratt, '85, studying electricity, Harvard University.

Fred. F. Bullard, '87, with Brown, Durrell and Co., Importers, Boston.

A. S. Cushman, '88, studying chemistry at the Worcester Technical Institute.

F. W. Hoadly, '88, Engineer Corps, Chicago, Burlington & Northern Railroad. De Soto, Crawford County, Wis.



Did you go to Springfield, Wednesday?

The Catalogue for 1885-6 comes out this week.

How much studying did you do Thanksgiving?

Amherst and Tufts will replay the first game of their series.

Mechanicals should be especially interested in football, it is such a block-and-tackle game.

The first rehearsal of the Glee Club took place on the 19th inst.

All the juniors not in Course III, begin Physical Laboratory this week.

The lectures in industrial chemistry are this year illustrated with the stereopticon.

The junior geologists made an all-day excursion to Marblehead last Saturday.

The Architects are complaining of too much work, and too little time to do it in.

The fourth year mechanicals have begun engine-lathe work at the shops.

'87 have elected S. W. Bowles, Jr. and Quintard Peters to the gymnasium committee.

At any rate, there are no goose-eggs in *our* league record this season, and in total number of points won the Tech still stands ahead.

The *Herald* was not far off in calling Holden the best player in the Northern Intercollegiate League.

Sufficient space was reserved in making up *Technique* so that the record of the entire championship series will be published in it.

'87 men complain that their class colors, blue and orange, being complimentary shades, are painful reminders of last year's Optics.

A new hand centrifugal machine made by Warmburn, Quilitz & Co., Berlin, has been added to the Industrial Chemical Laboratory.

Mr. A. S. Warren, '88, has recently been elected into the 2 G Society. He will undergo his initiation shortly.

Now doth the weary and over-worked senior nose around in search of a subject for a thesis that will insure him a degree with the minimum amount of work.

The mechanicals think that a very valuable and very practical addition to the engineering laboratory, would be a complete cider-mill in good working order, ready for testing.

About eighty couples attended the gymnasium party, a week ago Saturday. There was rather a preponderance of ladies present, but in other respects the affair was a complete success.

The old supply-room of the Industrial Laboratory has been remodeled and completely equipped as a dying-room. Five new kettles have been provided, and other appurtenances.

It is reported that Bass and Tracy, both of the Exeter team that defeated Andover, Nov. 14th, intend to enter the Institute next fall. They will be excellent material for the team.

The new pin of the Cycling Club will soon be ready. It is of modest size, and resembles the first wheel of a bicycle, the spokes and letters T. C. C. being in black enamel.

Prof. Crosby has kindly provided the junior geologists with an eight-page pamphlet giving a complete list of all important points covered in this year's work. It will be invaluable assistance in reviewing,

The papyrograph notes on third year Physical Laboratory, cover eight closely written pages; the papyrograph notes on Heat cover twelve pages; and it would seem that the whole might have been printed in a small pamphlet.

A series of ten-hour boiler tests have been begun by the senior mechanicals and electricals

on the boilers in the Rogers building. The first test was made on Monday, Nov. 23d, beginning at 6 o'clock A. M., and another on Monday, Nov. 30th, requiring seven men each. Eighteen of these tests will be made during the winter.

A large proportion of the class of '89 met Saturday, the 21st,— Mr. Bardwell in the chair,— and voted to form a class society. A committee of six, Messrs. Bardwell, Olzendam, Simpson, Young, La Rose and Bailey was chosen to draw up a constitution, and report in two weeks.

The K. S. held their first regular meeting on the 20th, at Young's. After business, a number of valuable technical papers were presented. The society will meet every month, and proposes to procure a number of copies of all chemical examination papers issued at the Institute, the collection to be accessible to members only. All executive business is intrusted to a committee of three.

A large part of the '87 students in the General Course donned their sniping-suits recently, and took an afternoon's tramp through the woods. They reported fine hunting, and brought back with them quite a plump robbin and a sparrow. They said that they had shot a number of tin cans, but did not stop to pick them up.

The first of the series of afternoon gymnasium parties to be given this winter under the auspices of the three Greek-letter fraternities, is announced for Dec. 12th. Tickets may be procured from any of the managers, of whom there are six, two from each fraternity. Parties are also promised for February and March, under the same management.

Time, 10.15 A. M.

Place, Third year Geology Lecture-room.

Professor: — "As the majority of the class seem to be in favor of making the excursion this forenoon rather than this afternoon, I will meet you at the square as soon as possible after eleven."

Enthusiastic geologist, — "We'd have more time if we went now!"

THE COLLEGE WORLD.

HARVARD.—The complete list of students at Harvard shows a gain of 59 in the academical department over last year. — The price of board at Memorial for the past month has been \$3.98 per week. — The University crew is still rowing on the river, and will continue to do so till snow falls. — Dr. Peabody is stricken with deafness. — A Freshman Glee Club has been started on the same plan as that of last year, which worked so successfully. — The list of special students at Harvard numbers now almost 125.

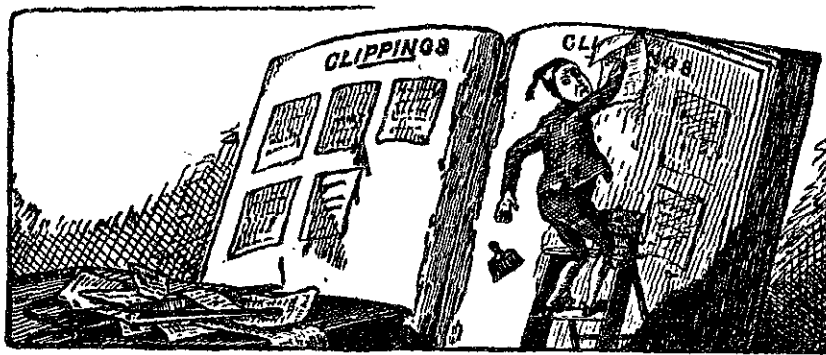
PRINCETON.—Princeton has formed a Hare and Hounds Club, and has had some runs.—The trustees of Princeton have determined to abolish hazing, and have appointed a committee to report on the best means to accomplish it. — Since Dr. McCosh has been president of Princeton, over \$5,000,000 have been donated to the college. — Princeton, '87, has lost forty men during the past year. — Princeton is leading in the inter-collegiate chess tournament.

YALE.—The Yale "Co-op." has 160 members. — Prof. Timothy Dwight has been widely recommended for the presidency of Yale. Gen. F. A. Walker, who was formerly professor of political economy at Yale, has also been mentioned as a possible candidate. — Yale has 31 colored students in the freshman class. *Ex.*

IN GENERAL.—The inter-collegiate base-ball association is in debt \$400 to its umpires. *N. Y. Clipper.* — Sixty students of the Ohio Wesleyan University have been suspended till January for attending a theatrical performance, contrary to the orders of the Faculty. — Exeter has won the championship over Andover in football, baseball, and tennis this year. — Phillips Exeter, Phillips Andover, St. Mark's, St. Paul's, and Adams Academies, and the Boston Latin School will form a football league. — The new president of Magdalen College, Oxford, is about the youngest man ever appointed head of the house — being about thirty-five years old. The place is worth \$7,500 a year, with a spacious residence, and certain allowances. *Ex.* — Sen-

ior year studies in Columbia College are to be made entirely elective. — The Alumni of Columbia College will have their annual dinner at Delmonico's, on Dec. 11th. — The annual examinations have been abolished at Williams. — The inter-collegiate Young Men's Christian Association will hold its annual meeting at Brown University this year, probably some time in February. — Brown has just received 7,200 volumes at her library. The library now contains 63,000 books and pamphlets. — Quite a commotion has lately occurred at the University of Michigan, Ann Arbor, caused by a policeman's interfering with a large crowd of students, who, according to accounts, were perfectly well behaved. Two of their number being arrested, a mass-meeting was held by about nine hundred students, who emphatically denounced the authorities. — There are 54 graduate students at John Hopkins. — At Brown the police have been visiting the rooms in search of stolen signs, and have caused much trouble. — Oberlin College has recently dedicated a library building, toward which \$25,000 was given by Rev. C. V. Spear, of Pittsfield, Mass. — An effort will be made to establish lacrosse at the University of Pennsylvania. — At the University of Pennsylvania a man may be excused from examination if his standing for the term has been "very good." — Most of Canon Farrar's lectures in this country have been to college students. — The Sophomores have won the class championship in baseball at Dartmouth, winning three games and losing none. — Cambridge University in England, has a total of 2,682 undergraduates. — The Mormons are about to establish a college at Salt Lake City.

The Glee Club has been greatly strengthened by the addition of several tenors and an excellent second bass, and there is reason to expect some fine concerts before the season closes. Mr. Underhill, formerly of '87, will take the position of leader, and there will be two rehearsals a week. A number of short singing trips are contemplated.



PROPRIETY.

They have come in from a stroll,
And he pauses to take toll
At the gate;
But she archly tells him, "No,
It would not be *comme il faut*;
Just you wait!"

He perceives his only chance
Lies in feigning nonchalance,
Just to tease;
So he bids a calm good-night
In the moon's alluring light,
Quite at ease.

But he turns back to the gate,
At her half disconsolate
Little call.
"I don't mind," she whispers low,
"If it isn't *comme il faut*,
After all!"

Harvard Lampoon.

Papa (soberly): "That was quite a monstrosity you had in the parlor, last evening?"

Maud (nettled): "Indeed! That must depend on one's understanding of the term 'monstrosity.'"

Papa (thoughtfully): "Well, two heads on one pair of shoulders, for example."—*Ex.*

A photographer recently located in a Western city. He hung out a sign on which was inscribed: "Babies Taken Without Previous Notice." Next morning he found three infants on his doorstep.

Elijah: "Say, Zeek, I heah yo' brudder married a rich heiress; am dat so?"

Zeek: "Yes; she's wuth 'bout fi' million."

Elijah: (surprised)—"So much as dat?"

Zeek: "It's fi' million or fi' hundred, I dunno wich, but I know it is 'normous 'mount."—*Harper's Bazar.*

"Step right into the parlor, and make yourself at home," said the nine-year-old son of the editor, to his sister's best young man. "Take the rocking-chair, and help yourself to the album. Helen Louise is up stairs, and won't be down for some time yet,—has to make up her form, you know, before going to press."—*The Fudge.*

RELIGIOUS INTELLIGENCE.—"There has been a revival in our town." "Many people converted?" "O yes; and among them, twenty pupils of the female college." "How do you know they are converted?" "Because they have declared their determination to flirt with none but divinity students hereafter."—*Texas Siftings.*

FROM THE GERMAN.—*Carl:* "Mother, in the milk-bucket a dead mouse was."

Mother: "Well, has thou it thereout taken?"

Carl: "No; I have the cat therein thrown."—*Ex.*

"Though one swallow does not make a summer, it sometimes causes a spring," remarked a senior, as he darted from the room after taking a mouthful of boiling coffee.—*Yale Courant.*

Mr. Isaacstein (giving his little boy Jacob a lesson in percentage): "Now, Jacob, ven you puy some dings for vun toller, und sells him for two toller, how much per cent vas dot?"

Jacob: "Dot vas vun per cent."

Mr. Isaacstein (earnestly): "Ya, dot is right; but remember, Jacob, dere is no money in dot vun per cent pizness."—*Life.*

"Tommy," said his grandfather, "of what shape is the earth?" "Don' know," replied the urchin. "Well, sir, what is the shape of my snuff-box?" "Square, sir." "No, not that one; my Sunday snuff-box?" "Round." "Well, then, what's the shape of the earth?" "Round on Sundays, and square on week-days!"

Henry James, the novelist, looks strikingly like the Prince of Wales. It isn't often that two men have such hard luck.—*Ex.*

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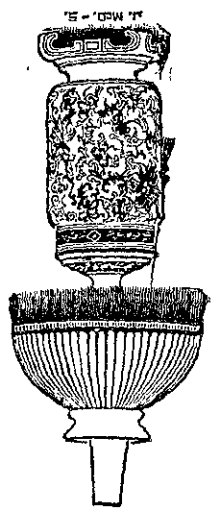
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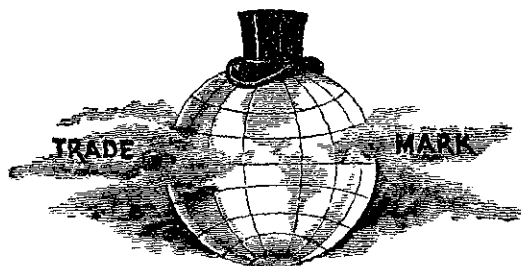
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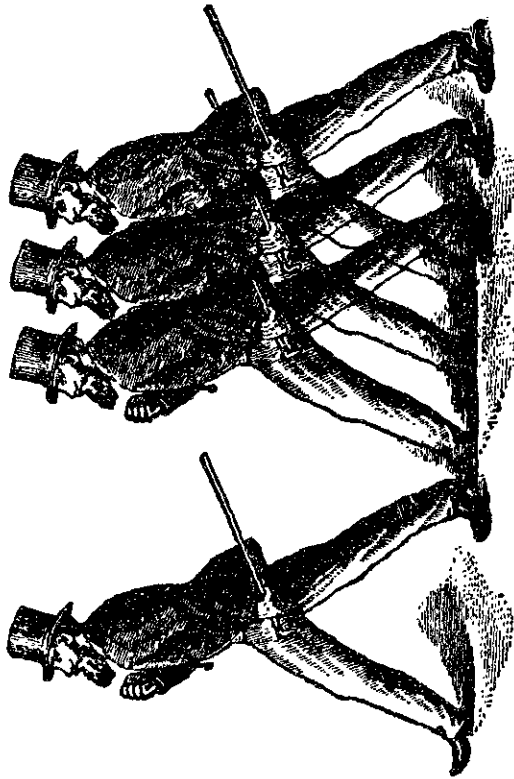
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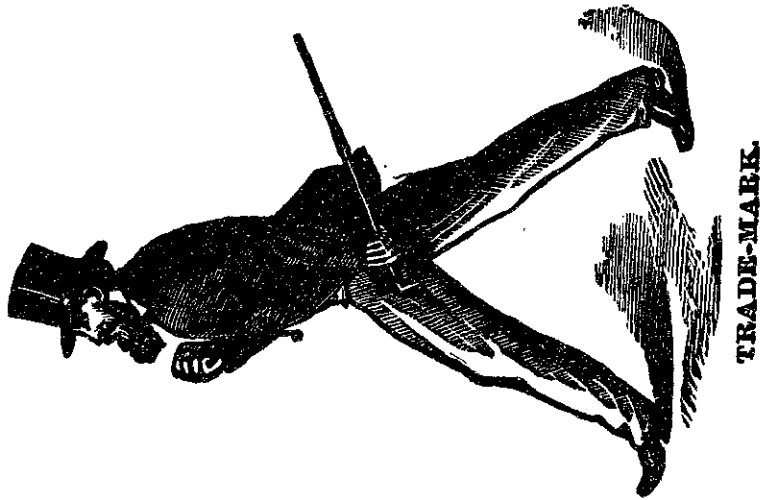
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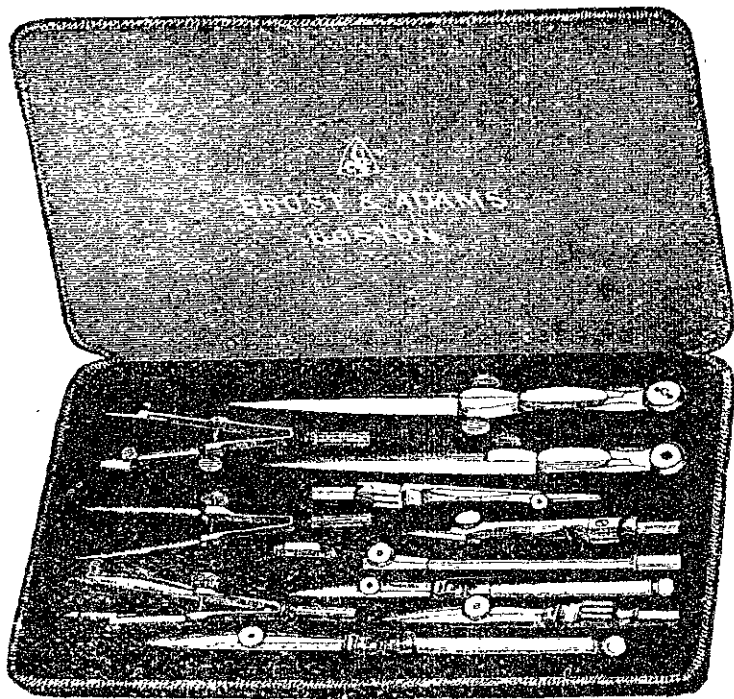
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